STATEMENT OF WORK (SOW)

FOR THE

COMMERCIAL BROADBAND SATELLITE PROGRAM (CBSP)
UNIT LEVEL VARIANT (ULV)

27 November 2012

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Commercial Broadband Satellite Program (CBSP)
Unit Level Variant (ULV)

1.0 INTRODUCTION

1.1 Scope

This Statement of Work (SOW) establishes the tasks required to procure, integrate, test, support, and deliver the Commercial Broadband Satellite Program (CBSP) Unit Level Variant (ULV) terminal and modem systems. The CBSP ULV systems and associated spares shall be compliant with the requirements set forth, respectively, in the CBSP ULV Performance Specification.

1.2 Background

CBSP is intended to augment the Navy's shipboard military satellite communications (MILSATCOM) capabilities by providing commercial satellite communications (COMSATCOM) connectivity capability along with providing MILSATCOM connectivity for platforms not large enough to host the MILSATCOM Program of Record terminals.

2.0 APPLICABLE DOCUMENTS

2.1 Specifications, Standards and Handbooks

ASTM-D-3951; Standard Practice for Commercial Packaging
DI-EMCS-80200B; Electromagnetic Interference Test Report
DI-EMCS-80201C; Electromagnetic Interference Test Procedure
DI-ENVR-80708; Shock Test Report
DI-ENVR-80709; High Impact Shock Test Plan or Procedure
FED-STD-313D; Material Safety Data Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities
MIL-DTL-31000C; Technical Data Packages
MIL-STD-129P; Military Marking for Shipment and Storage
MIL-STD-2073-1D; Standard Practice for Military Packaging
MIL-STD-882D; System Safety Program

Unless otherwise indicated, copies of Military specifications, standards and handbooks are available from:

Defense Standardization Program
http://www.dsp.dla.mil

2.2 Other Government Documents

The following other Government publications form a part of the specification to the extent specified herein. Unless otherwise specified, the versions shall be those in effect on the date of the solicitation.

DEPARTMENT OF LABOR, OCCUPATIONAL SAFETY AND HEALTH AGENCY (OSHA)

Code of Federal Regulations (CFR), Title 29
Occupational Safety and Health Standards

Applications for copies should be addressed to:

Department of Labor
Occupational Safety and Health Agency (OSHA)
Washington, DC 20210

3.0 APPLICABLE DEFINITIONS

3.1 Failure
A failure is the event, or inoperable state, in which any item or part of an item does not, or would not, perform as required.

3.2 Waiver
A waiver is the acceptance of an item, which during manufacture, or after having been submitted for Government acceptance is found to depart from specified requirements, but nevertheless is considered suitable for use "as is" or after repair by an approved method. An approved waiver is a temporary departure from the requirements and does not change the product baseline. This does not apply to software code listings. A major waiver consists of a departure involving: safety; performance; interchangeability; reliability; survivability; or maintainability. A minor waiver is a departure that is not classified as major.

3.3 Deviation
Deviation is the Government approval prior to the manufacture of an item, to depart from a particular requirement(s) of an item's current approved configuration documentation for a specific number of units or specified period of time. A deviation is a temporary departure from the requirements and does not change the product baseline. This does not apply to software code listings. A major deviation consists of a departure involving: safety; performance; interchangeability; reliability; survivability; or maintainability. A minor deviation is a departure that is not classified as major.

3.4 Major (Class 1) Changes:
Affects approved baselines, contractually specified form, fit or function requirements such as:

- Performance
- Reliability, maintainability, survivability
- Weight, balance, moment of inertia
- Interface characteristics
- Electromagnetic characteristics (i.e., requirement would be out of specification limits)
- Other technical requirements of the specification

Affects one or more of the following, after product baseline:

- Product furnished by a customer (GFE)
- Safety
- Compatibility with interfacing products (including such products as test equipment, support equipment and associated software)
- Delivered operation or servicing instruction, for which there is no planned and funded update requirement, such as for periodic or continual maintenance of the instructions
- Preset adjustment to the extent that product identification should be changed
- Interchangeability, substitutability, or replaceability as applied to Configuration Items (CIs) and to all subassemblies and parts except the pieces and parts of non-repairable assemblies

Requires retrofit of delivered products, e.g., by product recall, modification kit installation, attrition (replacement during maintenance by modified spares), etc. Affects cost/price to customer(s) (including incentives and fees), guarantees, warranties, contracted deliveries or milestones; and is an engineering change that does not impact factors 1 through 3.

3.5 Minor (Class 2) Changes:
Minor (Class 2) Changes are those changes which impact none of the Class 1 factors specified above.

3.6 O-Level Maintenance
Corrective maintenance is characterized by the use of both preventive maintenance procedures and corrective maintenance actions that provide for the rapid detection, localization, and isolation of failure to the defective lowest replaceable unit (LRU). Maintenance concept for repair of failures shall be the replacement of LRUs to restore the equipment to operational readiness. System Built-in test (BIT) or on-line diagnostics shall be used to assist the maintainer with isolating failures. For LRU's located within the antenna radome, maintainer access is required to support at-sea repairs. An access hatch or panel for the ULV terminals shall be required to provide maintainer access. LRU removal and replacement procedures shall be included in the equipment technical manuals, as well as casualty restoration and system testing methods.

There shall be no preventive maintenance task for the system required more frequently than semiannually if it takes any equipment off line and total preventive maintenance for each terminal shall not exceed 6 man-hours annually.

3.7 D-Level Maintenance

Corrective maintenance that consists of Contractor field engineering services for maintenance beyond the O-level (or I-Level, if proposed), for depot repair of defective LRU's, and for equipment overhaul as needed. During the warranty period, the Contractor shall maintain required depot-level maintenance personnel and materials to repair failed LRU's, and for overhaul of components. Identification of the level of stock, repair components, and the maintenance of that inventory is the responsibility of the Contractor.

4.0 GENERAL REQUIREMENTS

The CBSP ULV system shall meet all requirements of ULV Performance Specifications and this SOW. The requirements identified in the ULV Performance Specification establish the functional baseline of the ULV system.

This section identifies the tasks to be accomplished by the Contractor during production, integration, testing, and delivery of the ULV system. These tasks include contract management, risk management, and contract data requirements management. The Contractor shall perform the tasks set forth in this SOW and shall comply with all Contract Data Requirements Lists (CDRL) submittals, all invoked specifications, and other referenced documents.

4.1 Data

Data items as described herein shall be provided by the Contractor. All data items, except for the drawings, shall be readable, and with format maintained, by Microsoft Office Products™. The drawings shall be delivered in accordance with best commercial practice.

4.2 Drawing Packages

The Government will install the ULV system on board ships. To do so, certain engineering information is required. The Contractor shall provide the information by submitting two drawing packages and associated documentation for the hardware and software terminal components and LRUs.The ULV system commercial drawing package shall include:

a) Definition of hardware and software interfaces
b) Recommended installation criteria
c) Recommended installation test and verification procedures and requirements
d) Installation restrictions
e) Weight and physical dimensions of each terminal component and LRU
f) Center of gravity and physical dimensions of the antenna and the rack assembly
g) Form factor and mounting requirements of each terminal component and LRU
h) Power requirements for each power interface to external power
i) Cooling requirements
j) Any assembly during installation and with other interfacing systems
k) Center of wind resistance of the antenna
l) Heat dissipation for below deck equipment (BDE)
m) Cabling and connector pin-outs of all components/LRU's within the BDE Rack, Antenna, Antenna pedestal and cross-deck cabling between the BDE and above deck equipment (ADE)
n) Additional information necessary for accurate interface control

In addition, the Contractor shall provide detailed drawings for each mechanical, electrical, or electronic component used in a ULV system. Product drawings/models and associated lists shall be prepared to provide the design, engineering, manufacturing, and quality assurance requirements information necessary to enable the procurement or manufacture of an item essentially identical to the original item. The product shall be defined to the extent necessary for a competent manufacturer to produce an item, which duplicates the physical, interface, and functional characteristics of the original product, without additional design engineering effort or recourse to the current design activity. Product data shall reflect the approved, tested, and accepted configuration of the defined delivered item.

CDRL Deliverable(s):

A001: Commercial Drawing Package
A002: Production Drawing Package

4.3 Frequency Allocation

The Contractor shall provide the necessary technical data to assist the Government in filing Stage 3 and 4 DD-1494 applications for all frequency bands and for all ship platforms. Stage 3 technical data shall consist of a combination of calculated and measured data. Stage 4 technical data shall consist of only measured test data.

CDRL Deliverable(s):

A003: Frequency Allocations

4.4 Information Assurance (IA)

In accordance with Department of Defense (DoD) 8500.2, DoD Information Assurance Implementation, All proposed IA/IA-enabled devices must be National Information Assurance Partnership (NIAP) or Common Criteria approved.

All DoD information technology (IT) systems require Certification and Accreditation (C&A) in accordance with DoDI 8510.01, Department of Defense Information Assurance Certification and Accreditation Process (DIACAP) Instruction and Department of Navy (DON) Platform IT Risk Approval Guidance. In order to support the required certification testing, the system provided shall be security hardened in accordance with the IA certification requirements using the most current Security Technical Implementation Guides (STIGs) and Defense Information System Agency (DISA) guidance. All equipment must have the latest patches installed. The vendor shall provide evidence that the system has been security hardened. At a minimum, such evidence shall include, Gold Disk, SRR, and eEye Retina scan results, and all manual checklists associated used to secure the baseline system.

Further, it is recommended that original equipment manufacturer (OEM) support for each product be provided to support mitigation efforts and reduce possibility of Contractor incurred work stoppage while waiting for manufacturer input. Efforts shall be supported until Navy IA accreditation and Fleet Readiness Certification Board (FRCB) approval is received.

4.5 Contract Management

4.5.1 Contract Management Reporting

The Contractor shall submit monthly Contractor's progress, status and management reports. The reports shall address the progress of the contract effort, status of any problem resolution or identification of new problems, summary of safety-related actions, significant events, updated contract schedule, and other data required to be included by other paragraphs within Section 3 of the ULV Performance Specification.

The reports shall also address cost and personnel information, specifically the Contractor shall report if the cost of products/services provided during the affected period is commensurate with the available funding and anticipated burn rate as well as the total number of "direct charge" employees working on the contract. The Contractor shall also indicate the average number of full time equivalents (FTEs) that were performing during the reported period. The Contractor shall also report per CLIN/SLIN/ACRN, the following: this period and cumulative labor hours by labor category; this period and cumulative labor cost per labor category; this period and cumulative material, other direct costs (ODCs) and travel with associated costs; the percentage of work complete under the CLIN/SLIN; and the cost estimate to complete the CLIN/SLIN.

CDRL Deliverable(s):

A004: Contractor's Progress, Status, and Management Report

4.5.2 Contract Reviews

At the request of the Government, the Contractor shall host or attend contract reviews, consisting of progress of the contract effort, status of any problem resolution or identification of new problems, summary of safety-related actions, significant events, updated contract schedule, and other data required to be included by other paragraphs within Section 3 of the ULV Performance Specification. The Contractor shall be prepared to support one (1) review per month.

4.5.3 Post Award Conference (PAC)

The Contractor shall hold a PAC within thirty (30) business days after contract award. The Government, in conjunction with the Contractor, will establish the specific date. At a minimum, the Contractor shall discuss the following topics at the conference:

a) Identify and introduce Contractor management, engineering, and other key personnel to the Government representatives. Each individual shall define his/her area of responsibility and accountability
b) Explain the Contractor's organization, plans, procedures, and schedules to execute SOW and perform to the standard of the ULV Performance Specification
c) Present the Contractor's business and technical management procedures (e.g., technical point of contact assignments, status reporting procedures, designated lines of authority) that shall be implemented to accomplish the requirements of the contract
d) Present the Contractor's current staffing plan
e) Identify status of subcontracts in effect or anticipated
f) Allocate time for the Government to present its organization, plans, procedures, schedules, and concerns
g) Allocate time for an open forum to discuss contract-related issues

CDRL Deliverable(s):

A005: Report, Record of Meeting / Minutes

4.6 Technical Reviews and Updates

The various design reviews may be spread over several events or combined into categories other than indicated below, provided that the Contractor-proposed design reviews are authorized by the Government. The Contractor PM shall ensure that all Contractor action items are understood and implemented. The Contractor shall provide the analyses and methodologies used in arriving at specific recommendations and conclusions for a design approach. The Contractor shall make applicable engineering data, specifications, drawings, schematics, design and test documentation, software development files (including design documentation, screen mock-ups, object oriented design analysis), schedules, working papers and results of studies and analyses available for reference and Government inspection at the reviews. The Contractor's key personnel that are supporting review topics shall be available to respond to Government inquiries. Subcontractors of critical items shall present at all design reviews.

CDRL Deliverable(s):

A005: Report, Record of Meeting / Minutes

4.6.1 Preliminary Design Review (PDR)

The Contractor shall conduct a PDR to: 1) evaluate the progress, technical adequacy, and risk resolution of the design approach, 2) determine compatibility with performance and engineering requirements for the development specifications, 3) establish the existence and compatibility of the physical and functional interfaces among items of equipment, facilities, computer programs, and personnel, and 4) identify the user system interface requirements definition. The Government, in conjunction with the Contractor, will establish the specific date of the PDR.

CDRL Deliverable(s):

A005: Report, Record of Meeting / Minutes

4.6.2 Critical Design Review (CDR)

The Contractor shall conduct a CDR to demonstrate that the final design satisfies the performance and engineering specifications listed in the ULV Performance Specifications. The Government, in conjunction with the Contractor, will establish the specific date of the CDR. The Contractor shall establish detail design compatibility among system components and assess configuration item risk areas. The CDR shall focus on determination and acceptability of the design, risk mitigation, and testing strategy provided during the PDR. During CDR, the Contractor shall:

a) Establish that the detailed design solutions, as reflected in the preliminary design documentation, satisfy the requirements established in the Government-provided specifications
b) Demonstrate control of the overall technical program risks associated with technical, cost, and schedule aspects

c) Demonstrate the establishment of an effective man-machine interface. The Contractor shall implement an HSI process and reporting system using the guidance provided in the MIL-STD-46855A, using MIL-STD-1472F, to evaluate and integrate HSI elements into the CBSP ULV and supporting systems engineering process.
d) Establish the adequacy of specific software functionality and documentation
e) Present the status of specifications, Interface Control Documents, drawings, reliability predictions, and acceptance test plans
f) Identify electrical and mechanical design LRU's
g) Provide the following data: size, weight, thermal design, vibration, and shock analysis, along with circuit tolerance analysis
h) Present BIT/BITE approach

CDRL Deliverable(s):
A005: Report, Record of Meeting / Minutes

4.6.3 Technical Status Updates

The Contractor shall conduct a teleconference with the Government via phone twice (2x) a month to provide an update on the technical status of the ULV system and program. Contractor shall provide access to necessary key technical personnel during the updates. Content of the updates shall include at a minimum:

a) Applicable engineering data
b) Discussion and analysis of production failures
c) Troubleshooting discussions
d) Results of studies
e) Discussion on technical updates to the terminal
f) Discussion on software updates

CDRL Deliverable(s):
A005: Report, Record of Meeting / Minutes

4.7 Configuration Management

The Contractor shall plan, implement, and maintain a Configuration Management (CM) program for the CBSP ULV system that includes Configuration Item (CI) identification, control, status accounting, and audits that ensures configuration control of the CBSP ULV drawings and Specification. The Contractor shall provide a CM Plan (CMP) that describes the Contractor's CM program, how it is organized, how it will be conducted, and the methods, procedures, and controls for effective configuration identification, change control, status accounting, and audits of the total configuration including hardware and software. The Contractor shall develop a CMP using MIL-HDBK-61A(SE) and American National Standards Institute (ANSI)/Electronic Industries Association (EIA)-649-B for guidance. As part of the CMP, the contractor shall develop and maintain a CBSP ULV system hardware and software family tree that details CIs in a TDBD format. The family tree shall provide the breakdown for the complete design down to the MSI level (i.e., removal and replacement of an item/component either at the organizational or intermediate level, but not including piece parts). The CI breakdown shall be performed by the Contractor using the information provided herein for completing the analysis. Unique Identification (UID) A code (Y-yes or N-no) to identify whether the item will have a UID code provided on the equipment for configuration tracking in accordance with Defense Federal Acquisition Regulation Supplement (DFARS) Clause 252.211-7003 requirements.

a) Indenture Code: A code which illustrates a lateral and descending "family tree" relationship of each line item to and within the system or end item and its discrete components (units), assemblies and subassemblies.

b) Reference Designator: Letters or numbers, or a combination of both, used to uniquely identify and locate discrete units, portions thereof, and basic parts of a specific component. The reference designation shall result in the arrangement of provisioning lists for electronic and electronic-related equipment being in alphanumeric reference designation order in accordance with Institute of Electrical and Electronic Engineers (IEEE) 200-75 and top-down order.

c) Reference Number: Any number, other than a Government activity stock number, used to identify an item of production, or used by itself or in conjunction with other reference numbers, to identify an item of supply. Reference numbers include part or identifying number, drawing, model, type, item

designator, or source controlling numbers; manufacturer's trade name; specification or standard numbers; and specification or standard part, drawing, or type numbers (for applicable formats see DoD 4100.39-M).

d) Commercial and Government Entity Code (CAGE): A five-character code assigned by the Defense Logistics Information Service (DLIS) to the design control activity or actual manufacturer of an item as contained in the Defense Logistics Agency's (DLA) Cataloging Handbook H4/H8 Series.

e) Item Name: Is an identifying noun with appropriate adjective modifier, as contained in Federal Item Name Directory for Supply Cataloging, H6-l. Item Names contained in Federal Item Name Directory for Supply Cataloging, H6-l, cannot be abbreviated unless approved by the requiring authority.

CDRL deliverable(s):

A006 Contractor's Configuration Management Plan

4.7.1 Configuration Identification

The Contractor shall provide detailed information on Configuration Identification procedures, processes, and numbering. The Contractor shall establish and develop the detailed information in the TDP necessary to accomplish CM of each configuration item. Drawings shall be uniquely numbered, and new drawing numbers shall be assigned when interchangeability is affected by an engineering change.

4.7.2 Nomenclature Assignment and Identification Plates

The Contractor shall assign nomenclatures to the CBSP ULV in accordance with MIL-STD-196E, "Joint Electronics Type Designation System". All ILS products defined in section 4.8 of this SOW shall use the official nomenclature assignment once approved by the Government. All other documentation detailed in this SOW will track to the official nomenclature assignment to the greatest extent possible.

For identification of the system into the Government inventory, military nomenclatures (e.g., type designator and item names) shall be assigned by the Government based on information provided by the Contractor on the DD Form 61 "Request for Nomenclature" for entry into the Joint Electronics Type Designation Automated System (JETDAS) system (https://tdas6.monmouth.army.mil/jetdas/).

The Contractor shall refer to MIL-P-15024/5, "Military Specification Sheet, Identification" for nameplate assignment requirements. Nameplates shall be provided for nomenclature assignment for all "unit" equipment. Nameplates may be any size that is compatible with the size of the equipment to which the plate will be attached.

4.7.3 Unique Identification

The Contractor shall comply with DoD UID policy for equipment and spare parts in accordance with DFARS 252.211-7003 and MIL-STD-130N.

4.7.4 Request for Deviations/Waivers

The Contractor shall not manufacture items for acceptance by the Government that incorporate a known departure from requirements stated in the ULV Performance Specification or documentation produced in accordance with this SOW, unless a Request for Deviation (RFD) or a Request for Waiver (RFW) has been approved by the Government. The Contractor shall submit their RFD/RFW in a letter to the Government Contracting Officer's Representative (COR) and Procuring Contracting Officer (PCO). The RFD/RFW shall address the following issues:

a) Identify the change and reason for the change

b) Risks associated with implementation of the change

c) Interoperability

d) Replacement Recommendations

e) Impacts to Installations Control Drawing (ICD) and/or ULV Performance Specification

RFDs and RFWs may only be authorized or incorporated into the contract after approval by the Government COR and the signature of the PCO. The Government is not obligated to accept RFDs or RFWs. All changes to the ULV Performance Specification and/or ULV System variant configurations must be submitted for consideration and approved prior to implementation by the Contractor.

CDRL Deliverable(s):

A007: Request for Deviation (RFD)
A008: Request for Waiver (RFW)

4.8 Logistic Requirements

4.8.1 Provisioning

4.8.1.1 Provisioning Conference

The Contractor shall hold a ULV provisioning conference at the Contractor's facility at a time mutually agreeable to the Contractor and the Government, one hundred eighty (180) calendar days prior to delivery of the first ULV system. At the ULV provisioning conference, the Contractor shall provide the data cited in paragraph 4.8.7.1 plus computer access for data in electronic media, and access to a full suite of the subject (as determined by the subject of the conference) satellite terminal hardware for examination and disassembly.

4.8.2 Support Equipment

The Contractor shall submit for Government approval a list of support equipment, tools, and test equipment required for operation and maintenance of the ULV system. The Contractor shall ensure that no special tool or test equipment requirements are needed in the Organizational Level (O-Level) maintenance of the systems without Government approval. The Contractor shall identify and provide parameter requirements necessary for the use of test equipment to support maintenance. The Contractor shall provide all factory configuration procedures and any special devices necessary to install, test, and maintain LRU configuration and interoperability within the system. The Government will provide the associated test equipment model number that is currently in the DoD inventory for use. The Contractor shall obtain case-by-case Government approval for special purpose support equipment, tools, and test equipment associated with this acquisition.

Use of support equipment (for example, tool, extender cable, extender card, test equipment, etc.) necessary to support O-Level preventive or corrective maintenance shall be provided by the Contractor with each system delivery. The Contractor shall be responsible for all support equipment needed to support depot repair (LRU repair and restoration) and equipment overhaul.

4.8.3 Logistics Certification

The Contractor shall coordinate with the Government to identify all associated technical and logistics support documentation above that is required to support logistics certification prior to system installation of the ULV system. This includes the development and delivery status of safety precautions and warnings; hazardous material lists; drawing packages; configuration management items, including the system/ equipment top breakdown structure; equipment/ system levels of repair; maintenance procedures; equipment and system technical manuals; tools and test equipment lists; provisioning and supplemental provisioning data; recommended on-board repair parts (OBRP) and installation and checkout spares (INCO) lists; and factory training availability and training material delivery.

4.8.4 Logistic Support

The Contractor shall provide at design reviews, PMRs, and TIMs ILS planning that clearly defines the life-cycle ILS requirements and tasks in adequate detail to ensure that CBSP ULV installations can be supported in an operational environment.

4.8.5 Level of Repair Analysis (LORA)

The Contractor shall perform a Level of Repair Analysis (LORA) of the CBSP ULV to establish the performance level at which an item will be replaced, repaired, or discarded based on economic and non-economic considerations and operational readiness requirements. The Contractor shall provide rationale for how the non-economic analysis was performed and how the results were derived. The Contractor shall use a DoD- or Government-approved industry standard LORA model to conduct the LORA.

CDRL deliverable(s):

A009: LORA

4.8.6 Repair or Replacement of LRUs

When an LRU is received for repair, the Contractor shall analyze the cost of the repair in accordance with best commercial practice and recommend repair or replacement accordingly. The LRU shall be repaired or replaced

within one month of receipt of the failed LRU. To ensure, LRU's can be repaired and replaced within the required time frame, the Contractor shall maintain a sufficient inventory of spare LRUs. The Contractor shall submit a monthly summary of repair and overhaul actions.

CDRL Deliverable(s):

A010: Repair and Overhaul Actions Report

4.8.7 Supply Support

4.8.7.1 Provisioning Technical Documentation

The Contractor shall prepare/update Provisioning Screening Data (PSD) through Defense Logistics Support Center (DLSC) for first-appearance items (first to be produced). The provisioning screening results shall be input by the Contractor into the Contractor's Supply Support Supportability Analysis Summaries (SAS) worksheet. The Contractor is authorized to use Parts Master or other commercial-type provisioning screening process as approved by Naval Supply Weapons System Support (NAVSUP WSS). The Contractor shall provide Provisioning Technical Documentation (PTD) in accordance with requirements herein, the Supply Support Logistic Management Information (LMI) SAS worksheet, and the associated deliverables.

During the provisioning conference review of the PTD the Contractor shall have available the LORA and FMEA CDRLs, as well as CBSP ULV equipment to aid in technical coding and cataloging. The PTD shall be provided in individual Provisioning List Item Sequence Number (PLISN) order as sequenced by reference designation and indenture code. The efforts shall provide a complete provisioning package in reference-designator and indenture-level order for the CBSP ULV equipment. A separate provisioning file shall be developed for each CBSP ULV nomenclature. The Provisioning Guidance Conference will be used to review Interactive Computer-Aided Provisioning System (ICAPS), Development Plan Document (DPD) elements, Standard Procurement System (SPS), and other provisioning requirements. The PTD baseline shall be updated to provide the provisioning efforts for DCNs during the EMD phase. The Contractor shall continue to submit DCNs for the life of the production contract.

CDRL deliverable(s):

A011: Interactive Computer Aided Provisioning System Data File Exchange

4.8.7.1.1 Supplemental Data for Provisioning

Approved Supplemental Data for Provisioning (SDFP) is required for all systems or equipment procured for Government use and for which PTD is being acquired. It is the technical data that provides definitive identification of dimensional, material, mechanical, electrical, or other characteristics adequate for provisioning of the support items of the end article(s) on contract. SDFP consists of data such as specifications, standards, drawings, photographs, sketches and descriptions, and the necessary assembly and general arrangement drawings, schematics, drawings, schematic diagrams, wiring and cable diagrams, or what is sometimes referred to as form, fit, and function. This data is necessary for the assignment of Source, Maintenance, and Recoverability (SMR) codes, for assignment of Item Management Codes, prevention of proliferation of identical items in the Government inventory, maintenance decisions, and item identification necessary in the assignment of a National Stock Number (NSN). SDFP format and content must be prepared in accordance with the latest industry standards and must be reproducible, as outlined below. Approved SDFP shall contain all appropriate annotations (e.g., proper Distribution Statements). For items without an NSN, recognized industry standard, or Government specification or standard, the following order of precedence is required for SDFP:

a) Technical data equivalent to approved Product Engineering Drawings as defined in MIL-STD-31000
b) Commercial drawings
c) Commercial manuals, catalogs, or catalog descriptions; and
d) Sketches or photographs with a brief description of dimensional, material, mechanical, electrical, or other characteristics.

SDFP shall include the following:

a) Technical identification of items requiring maintenance support considerations.
b) Preparation of item identification for the purpose of assigning NSNs.
c) Review for item entry control.
d) Standardization.

e) Review for potential interchangeability and substitutability.
f) Item management coding.
g) Preparation of allowance/issue lists.
h) SMR coding.

SDFP shall not be provided when the item is: (1) Identified by a Government specification or standard that completely describes the item including its material, dimensional, mechanical, and electrical characteristics; (2) Identified in Defense Logistics Information as having an NSN with salient characteristics identical to the item; and/or (3) Listed as a reference item (subsequent appearance of an item) on a parts list.

CDRL deliverable(s):
A012: Supplemental Data for Provisioning

4.8.7.1.2 Configuration Change
The Contractor shall submit Class I and Class II engineering change proposal (ECPs) only with the written approval of the Government. Requests for ECP submissions should be included in the monthly Contractor's Progress, Status and Management report (CDRL A003) and are not to be submitted without the explicit permission of the Government COR and the signature of the PCO.

Class I ECPs shall be prepared for Government approval whenever the Contractor believes that an alternative method, enhanced method, or an additional functionality is available to satisfy the contract specification or a proposed change will affect form/fit/function, software, LRU's within the system, training, technical manuals, provisioning data, DD 1494 Frequency Allocation Registration form information, or hazardous material information. Any substitute LRU which is approved by the Class I ECP process shall have the same warranty provisions as those which apply to the LRU being replaced.

Class II ECPs shall be used to correct grammatical errors in documentation and substitution of material or the addition of a device that does not affect any factor listed under the criteria for a Class I change. Class II ECPs shall be reviewed and approved by the Government. Class II ECPs require approval by the Government. The Contractor has the option of independently incorporating Class II ECPs that prevent obsolescence, improve reliability, or lower the cost of ownership. All costs associated with Contractor-initiated Class II ECPs shall be borne by the Contractor. In the event the Contractor directs a change in maintenance philosophy that necessitates new piece parts, the Contractor agrees to provide parts support and a technical data package for all new parts. The Contractor shall provide a list and description of any Master Change Orders (MCOs) associated with any design changes. It will be the Government's intention to provision these items utilizing the technical data package provided by the Contractor.

The Contractor shall submit all Class I and Class II ECPs for Government approval. Prior to implementing a Class I or Class II ECP, the Contractor must (1) report the report the issue in a monthly Contractor Progress, Status, and Management Report, (2) attain ECP approval from the COR and (3) get final PCO approval. The request for an ECP shall address the following:

a) Identify the change and reason for the change
b) Risks associated with implementation of the change
c) Interoperability
d) Replacement Recommendations
e) Impacts to ICD and ULV Performance Specification
f) Impacts to Training, Tech Manuals, and Drawings
g) Parts list and Provisioning data

CDRL Deliverable(s):
A013: Engineering Change Proposal

4.8.8 Training Services

4.8.8.1 Train the Trainer Curriculum

The Contractor shall develop a training curriculum package ("Train the Trainer") for the purpose of training users of the CBSP ULV. The Contractor shall provide all published training materials and guides associated with all COTS software and hardware, including all updated training materials after release of new commercially available versions of COTS products as part of CDRL A013. The Contractor shall provide the training curriculum in an editable version, and provide the Government with the rights to tailor the materials in accordance with Federal Acquisition Regulation (FAR) 52.227-17.

CDRL Deliverable(s):

A014: Train the Trainer Cirruculum

4.8.8.2 Technical Manuals

The Contractor shall provide technical manuals in accordance with the requirements of Appendix A, Appendix B (as applicable), and associated CDRL A014. Material submitted for approval shall include all technical documentation for the installation, service, troubleshooting and operation of the ULV system, per the requirements set forth in Appendix A , and in compliance with the standards set forth in Appendix B. If disparity arises between the requirements of Appendix B, the SOW and CDRL A014, the Contractor shall notify the Government and request clarification. The Contractor shall submit technical manuals for approval per CDRL A014 and Appendix A and B, as applicable. The Government shall review the material in accordance with the requirements of Appendix A and B (as applicable) and CDRL A014. If the Government determines that additional data is required to meet the requirements of Appendix A or B, the Contractor agrees to submit supplemental documentation for approval per CDRL A014. The Government reserves the right to reproduce technical manuals and data contained therein.

For all engineering changes or field changes, the Government will provide Government Furnished Information (GFI): the current Navy- approved version of the technical manual(s). The Contractor shall develop change pages based on the Navy-approved version of the technical manual and the Government will review them for approval in accordance with the requirements of CDRL A014. The Government reserves the right to reproduce the change pages and the data contained therein.

CDRL Deliverable(s):

A015: Technical Manuals

4.8.9 Packaging, Handling, Storage, and Transportation

The ULV system shall be packaged, handled, stored, and transported in accordance with the requirements detailed in ASTM-D-3951 unless ASTM-D-3951 does not meet Government requirements in which case the Contractor shall comply with MIL-STD-2073.

4.8.10 Diminishing Manufacturing Sources/Material Shortage

The Contractor shall be responsible for managing obsolescence over the entire period of the contract, and notwithstanding any obsolescence issues or problems, the Contractor remains responsible for meeting all performance and other requirements of this contract. This obsolescence management responsibility includes an ongoing review and identification of actual and potential obsolescence issues, including obsolescence of components, assemblies, sub-assemblies, piece parts, and material (hereafter referred to for purposes of this section only as "parts and/or material"). The Contractor is responsible for all costs associated with obtaining a replacement if and when any part and/or material become obsolete. The costs for which the Contractor is responsible include the costs of investigating part availability, interchangeability and substitutability, locating part replacement, vendor interface, engineering efforts, testing requirements, internal drawing changes. The Contractor shall prevent any additional costs from being incurred by the Government due to obsolescence. Any configuration changes due to obsolescence shall be approved in accordance with the CM requirements (section 4.7) of this SOW. The Contractor shall provide the Government with obsolescence status briefs as part of the periodic program reviews provided for under the contract.

4.8.11 Initial Software Delivery

Any software developed by the contractor for the purpose of this solicitation shall be delivered with a summary of the development and internal testing to ensure proper functionality. The Contractor shall provide a Software Test Report detailing development, test procedures, test results and recommended changes. The Software Test

Report shall be delivered during the PDR and CDR and updated in accordance with any modifications throughout the contract.

The Contractor shall develop and provide CBSP ULV Source Code from all software developed, funded, and produced under this contract.

CDRL Deliverable(s):
A016: Software Test Report
A017: CBSP ULV Source Code

4.8.11.1 Software Sustainment Support

The Contractor shall provide software sustainment support of the CBSP ULV systems. Software sustainment support shall include the following activities:

a) Identify any required modifications necessary to address issues, problems, and software failures.
b) The Contractor shall support software releases to address software updates and software trouble report resolution as coordinated with the Government.
c) Design and test software changes and modifications along with system regression testing to ensure changes are ready for release. The Contractor shall provide a test report for each software release.

4.9 Safety Data/Safety Assessment

The Contractor shall perform a safety assessment for the first ULV terminal system procured under the contract. To ensure requirements of the ULV Performance Specifications section 3.6.3 can be met, safety assessments of the ULV system shall be performed in accordance with MIL-STD-882C at the Contractor's facility prior to the delivery of the first ULV. The safety assessment shall also identify all safety features of the hardware, software and terminal design, and identify procedural, hardware and software related hazards that may be present in the terminal, including specific procedural controls and precautions that should be followed for risk mitigation. The safety assessment report shall document all safety assessment actions and findings, as well as a plan and schedule for correction. The Contractor shall submit a summary of all safety-related actions as part of the Contractor Progress, Status and Management Report (CDRL A005). The ULV system shall include the capability to allow the operator to limit transmit power to a specified value.

CDRL Deliverable(s):
A004: Contractor's Progress, Status, and Management Report
A018: Safety Assessment Report

4.9.1 Hazardous Materials

Any hazardous material as defined in FED-STD-313 which may be used in, supplied with, or required in support of, the supplied product shall be approved by the Government. A list of all hazardous material shall be submitted including, for each item, a material safety data sheet (OSHA Form 174) and written justification that shows the necessity for the type, container size and quantity of hazardous material (or material that results in hazardous waste) together with a listing of less hazardous potential substitutes that were considered and the reasons why these substitutes cannot be used. Order of precedence for acceptance shall be:

a) Non-hazardous material
b) Material that is recyclable
c) Material that results in hazardous waste that can be treated to reduce it to a non-hazardous state

Pertinent data and precautions from the material safety data sheets must be provided in all manuals and documentation delivered with the system. All hazardous materials containers must be labeled in accordance with MIL-STD-129, the Occupational Safety and Health Administration Standard, Code of Federal Regulations Title 29 Part 1910.1200, and applicable Environmental Protection Agency and Department of Transportation requirements. Parts containing hazardous materials must also be labeled. Hazardous Materials include:

a) Asbestos; asbestos compounds; and asbestos filled compounds
b) Cadmium, where it may be exposed to temperature above 205□C (401□F) or where it may come in contact with petroleum products
c) Carcinogens
d) Chlorofluorocarbons (CFCs, e.g., Freon)

e) Flammable or combustible materials
f) Lithium and lithium compounds (unless approved by the Government)
g) Magnesium or magnesium alloys
h) Mercury or its compounds and amalgams
i) Polycarbonated biphenyl (PCB)
j) Polyvinyl chloride (PVC) except when used as component leads
k) Radioactive material (unless approved by the procuring activity)
l) Zinc or zinc alloys unless otherwise specified
m) Class I ozone depleting substances
n) Beryllium and beryllium compounds (unless approved by the Government)
o) Ethylene glycol
p) Lead and lead compounds
q) Phenols and phenolic compounds
r) Aluminum electrolyte capacitors (unless approved by the Government)
s) Non hermitically sealed, wet tantalum capacitors

Any hazardous material or personal protective equipment required for maintenance shall be identified and any items such as chemical goggles, respirators, electrical gloves, shorting probes, etc. required during maintenance actions shall be identified as well.

CDRL Deliverable(s):
A019: Hazardous Material Support

4.10 Reliability and Maintainability Program

4.10.1 Reliability Tracking

The Contractor shall create and maintain a Failure Reporting and Corrective Action System (FRACAS) to document all problems found during EMD phase, covering all EDM units. The FRACAS shall document all problems found with the CBSP ULV and CBSP ULV-connected equipment including encryption devices during manufacturing, assembly, and testing, the causes of the failures and faults, and the corrective actions taken to resolve the failures and faults.

4.10.2 Failure Modes and Effects Analysis

The Contractor shall perform a Failure Modes and Effects Analysis (FMEA) for the CBSP ULV design to identify potential equipment (e.g., hardware and software) and system (e.g., IP user, crypto, and interfaces) weaknesses and provide an analysis of the test monitoring and diagnostic equipment capabilities. The analysis shall provide a description of each function, with schematic diagram backup material detailing the circuits involved with the function. All LRUs and components involved in that function shall be identified and listed with their failure rate. The analysis shall detail how fault(s) for that function are detected and isolated to the LRU level through on-line BIT/BITE, off-line BIT/BITE, and manually BIT/BITE message information and manual procedures, (if needed), shall also be detailed. This will also serve to verify the BIT/BITE performance as follows:

Class A (detection) percentage = Total sum of detected fault failure rate / Total failure rate
Class B (isolation) percentage = Total sum of isolated fault failure rate / Total failure rate

All functions associated with the CBSP ULV design shall have their fail rate computed based on the reliability model and its individual components' failure rates, such that the FMEA functions' fail rate shall be correlated to the reliability prediction fail rate, to ensure that the performance requirements of the CBSP ULV Specification have been addressed. Information from the analysis will serve as source engineering information in the development of maintenance Fault Logic Diagrams (FLDs) and procedures. See Appendix C for a detailed description of the FMEA.

CDRL deliverable(s):
A020: Failure Modes and Effect Analysis Study

5.0 ULV HARDWARE PROCUREMENT REQUIREMENTS (OPN, SCN, OCF) CLINS 0001-0014, 1001-1012, 2001-2012, 3001-3012, 4001-4012, 5001-5012, AND 6001-6012

The Contractor shall provide ULV hardware in accordance with the requirements stated within this SOW and the ULV Performance Specifications.

5.1 Test and Certification (OPN, SCN, OCF)

5.1.1 ULV Defense Satellite Communications System (DSCS) Certification

If the ULV system is not already certified for DSCS X-band operations, the Contractor shall provide pre-certification performance readiness test results for the first terminal/system procured under the contract to certify that the terminal/system is eligible to be scheduled for DISA certification in accordance with the DSCS Earth Terminal Certification Requirements, 1 July 1996.

CDRL Deliverable(s):

A021: Performance Readiness Test Results

5.1.2 Intelsat Standard G Data

The Contractor shall conduct tests to verify ULV G/T, transmit and receive antenna patterns, and transmit and receive axial ratio performance requirements for Intelsat Standard G terminals, as defined in IESS601 (Rev. 12) for the first ULV terminal/system procured under the contract. The Contractor shall notify the COR not less than ten (10) business days in advance of any tests to be performed. The Government may witness any or all performance verification testing. The Contractor shall provide a Terminal Test Report in accordance with CDRL A019.

CDRL Deliverable(s):

A022: Terminal Test Report

5.1.3 Verification Testing

In accordance with the ULV Performance Specification, section 4.0 and subsections, the Contractor shall provide a test plan for verification testing of the ULV system. After completion of verification testing, the Contractor shall provide test results to the Government.

The Contractor shall perform a shock test for the first ULV terminal/system procured under the contract and on all ULV BDE procured thereafter. The shock test procedure shall be developed in the format provided in DI–ENVR-80709, High Impact Shock Test Plan or Procedure, and provided to the Government for review prior to testing. The shock test report shall be submitted in accordance with the format provided in DI–ENVR-80708, Shock Test Report.

The Contractor shall perform a vibration test for the first ULV terminal/system procured under the contract and on all ULV BDE procured thereafter. The vibration test procedure shall be developed in the format provided in DI-ENVR-81647, Mechanical Vibrations of Shipboard Equipment Measurement Test Data, and provided to the Government for review prior to testing. The vibration test report shall also be submitted in accordance with the format provided in DI-ENVR-81647, Mechanical Vibrations of Shipboard Equipment Measurement Test Data.

The Contractor shall perform an Electromagnetic Interference (EMI) test for the first ULV terminal/system procured under the contract. The EMI test procedures shall be developed in the format provided in DI–EMCS-80201B, Electromagnetic Interference Test Procedure (EMITP), and provided to the Government for review prior to testing. The EMI test report shall be submitted in accordance with the format provided in DI–EMCS-80200B, Electromagnetic Interference Test Report (EMITR).

CDRL Deliverable(s):

A023: Verification Test Plans/Procedures
A024: Verification Test Results Report

5.1.4 Acceptance Testing

The Contractor shall conduct an Over-The-Air (OTA) operational test for each ULV system procured under the contract prior to formal delivery to Government in accordance with the approved Acceptance Test Plan/Procedures, CDRL A022 and A023. The Contractor shall demonstrate Ku-band, X-band and optional Ka operation on each ULV system. During Ku, C, X and Ka OTA testing, the Contractor shall demonstrate that the

ULV system is able to demonstrate a full duplex RF link over a Government provided satellite. The Contractor shall provide the Government at least seven (7) business days notification prior to test. If the Government is not able to secure satellite access, the Contractor shall perform test over an RF test translator. The Contractor shall deliver a test report for all OTA testing with each ULV system in accordance with CDRL A024.

CDRL Deliverable(s):

A025: Acceptance Test Plan
A026: Acceptance Test Procedure
A027: Acceptance Test Report

5.1.5 Radar Cross Section (RCS) Testing

The contractor shall participate in a test administered by the Government, for the first RCS kit procured under the contract prior to formal delivery to the Government. To conduct the RCS test, the contractor shall supply a flat sturdy foundation to serve as a lifting platform and test bed (surrogate for ship deck) for the CBSP ULV system. This platform is generally made of layered plywood, trimmed to a circular shape with a minimum diameter of 4" larger than the radome and thickness strong enough to support the radome and antenna without bowing. Additionally, the contractor shall provide two weeks of onsite support to assist in conducting the test.

5.2 Provisional Item Ordering (PIO) (OPN/OMN, SCN, OCF) CLINs 0014, 1012, 2012, 3012, 4012, 5012, AND 6012

5.2.1 Spares

The Contractor shall deliver spare parts for the ULV system for provisioning orders. PIO will be ordered by the Government in accordance with the PIO CLIN in the contract. The PIO CLIN will be further defined upon contract award. The Contractor shall provide pricing and delivery information for this material support as requested by the Government. The schedule for any material delivery shall be mutually agreed upon between the Contractor and the Government.

5.3 Contract Data Requirements List (CDRLs) (Not separately priced) CLINs 0015, 1013, 2013, 3013, 4013, 5013 AND 6013

The Contractor shall deliver all contract, technical, and/or engineering information in digital format. The Contractor shall post CDRLs to the PMW/A 170 SE2 CBSP project site, unless otherwise specified in the applicable CDRL DD 1423. The Contractor shall provide electronic-mail (e-mail) notification to the personnel identified on the CDRL Addressee List as stated within block 16 of the DD 1423 within twenty-four (24) hours of CDRL delivery.

5.4 Engineering Support Services (OPN, SCN, OCF) CLINs 0016, 0017, 1014, 2014, 3014, 4014, 5014, 6014, 1015, 2015, 3015, 4015, 5015 AND 6015

The Contractor shall provide professional qualified software, systems, electrical/electronic and mechanical engineers, and engineering technicians/personnel to assist Government personnel with installations, checkout and dockside tests; and to resolve other complex engineering and technical issues, as directed under Technical Direction Letters (TDL). The Contractor shall provide a monthly report of the services provided. The report shall include sites visited and services provided.

The contractor shall report ALL contractor labor hours (including subcontractor labor hours) required for performance of services provided under this contract for the Space and Naval Warfare Systems Command (SPAWAR) via a secure data collection site. The contractor is required to completely fill in all required data fields using the following web address https://doncmra.nmci.navy.mil.

Reporting inputs (from contractors) will be for the labor executed during the period of performance during each Government fiscal year (FY), which runs October 1 through September 30. While inputs may be reported any time during the FY, all data shall be reported no later than October 31 of each calendar year. Contractors may direct questions to the help desk, linked at https://doncmra.nmci.navy.mil.

CDRL Deliverable(s):

A028: Field Support Services Report

5.5 Factory Training (OPN, SCN, OCF) CLINs 0018, 1016, 2016, 3016, 4016, 5016 AND 6016
The Contractor shall provide factory training for Government personnel at the Contractor's facility for the ULV in an integrated course (e.g. train the training, hardware training). Training courses shall not exceed a total of four (4) weeks. The maximum class size shall not exceed twelve (12) students. Training shall be broken into two (2) week sessions. The Contractor shall provide the training material prior to first factory training. All training material used in the classes will become the property of the attendees.

5.6 Other Direct Costs (ODCs) (OPN, SCN, OCF) CLINs 0019, 1017, 2017, 3017, 4017, 5017 AND 6017
The Contractor may incur ODCs required to complete tasking identified in paragraph 5.4 and 5.5 of this SOW, upon Government approval.

6.0 ULV PIO, ENGINEERING SERVICES, TRAINING, AND ODCS (OMN) CLINS 0014, 0016, 0017, 0018, 0019, 1012, 2012, 3012, 4012, 5012, 6012, 1014, 2014, 3014, 4014, 5014, 6014, 1015, 2015, 3015, 4015, 5015, 6015, 1016, 2016, 3016, 4016, 5016, 6016, 1017, 2017, 3017, 4017, 5017 AND 6017

6.1 Provisional Item Ordering (PIO) (OMN) CLINs 0014, 1012, 2012, 3012, 4012, 5012, AND 6012
The Contractor shall deliver spares parts related to maintenance operations for the ULV system for provisioning orders. PIO will be ordered by the Government in accordance with the PIO CLIN in the contract. The Contractor shall provide pricing and delivery information for this material support as requested by the Government. The schedule for any material delivery shall be mutually agreed upon between the Contractor and the Government.

6.2 Engineering Support Services (OMN) CLINs 0016, 0017, 1014, 2014, 3014, 4014, 5014, 6014, 1015, 2015, 3015, 4015, 5015, AND 6015
The Contractor shall provide professional qualified software, systems, electrical/electronic and mechanical engineers, and engineering technicians to perform depot repairs; to diagnose and repair system failures and to resolve other complex engineering and technical issues, as directed under TDLs. The Contractor shall provide a monthly report of the services provided. The report shall include sites visited and services provided.

The contractor shall report ALL contractor labor hours (including subcontractor labor hours) required for performance of services provided under this contract for the Space and Naval Warfare Systems Command (SPAWAR) via a secure data collection site. The contractor is required to completely fill in all required data fields using the following web address https://doncmra.nmci.navy.mil.

Reporting inputs (from contractors) will be for the labor executed during the period of performance during each Government fiscal year (FY), which runs October 1 through September 30. While inputs may be reported any time during the FY, all data shall be reported no later than October 31 of each calendar year. Contractors may direct questions to the help desk, linked at https://doncmra.nmci.navy.mil.

CDRL Deliverable(s):
A028: Field Support Services Report

6.3 Factory Training (OMN) CLINs 0018, 1016, 2016, 3016, 4016, 5016 AND 6016
The Contractor shall provide factory training for Government personnel at the Contractor's facility for the ULV system in an integrated course. Operational and Maintenance training shall not exceed a total of four (4) weeks. The maximum class size shall not exceed twelve (12) students. Training shall be broken into two (2) week sessions. The Contractor shall provide the training material prior to first factory training. All training material used in the classes will become the property of the attendees.

6.4 Other Direct Costs (ODCs) (OMN) CLINs 0019, 1017, 2017, 3017, 4017, 5017 AND 6017
The Contractor may incur ODCs required to complete tasking identified in paragraph 6.2 and 6.3 of this SOW, upon Government approval.

7.0 ULV ENGINEERING SUPPORT SERVICES AND ODCS (RDT&E) CLINS 0016, 0017, 0019, 1014, 2014, 3014, 4014, 5014, 6014, 1015, 2015, 3015, 4015, 5015, 6015, 1017, 2017, 3017, 4017, 5017, AND 6017

7.1 ULV Engineering Support Services (RDT&E) CLINs 0016, 0017, 1014, 2014, 3014, 4014, 5014, 6014, 1015, 2015, 3015, 4015, 5015, AND 6015

The Contractor shall provide professional qualified software, systems, electrical/electronic and mechanical engineers, and engineering technicians to provide developmental support to resolve complex engineering and technical issues, as directed under TDLs. The Contractor shall provide a monthly report of the services provided. The report shall include sites visited and services provided.

The contractor shall report ALL contractor labor hours (including subcontractor labor hours) required for performance of services provided under this contract for the Space and Naval Warfare Systems Command (SPAWAR) via a secure data collection site. The contractor is required to completely fill in all required data fields using the following web address https://doncmra.nmci.navy.mil.

Reporting inputs (from contractors) will be for the labor executed during the period of performance during each Government fiscal year (FY), which runs October 1 through September 30. While inputs may be reported any time during the FY, all data shall be reported no later than October 31 of each calendar year. Contractors may direct questions to the help desk, linked at https://doncmra.nmci.navy.mil.

CDRL Deliverable(s):

A028: Field Support Services Report

7.2 Other Direct Costs (ODCs) (RDT&E) CLINs 0019, 1017, 2017, 3017, 4017, 5017 AND 6017

The Contractor may incur ODCs required to complete tasking identified in paragraph 7.1 of this SOW, upon Government approval.

8.0 ULV SECURITY LEVEL

The nature of this task requires access to CONFIDENTIAL data, information, and spaces. The Contractor will be required to attend meetings classified up to CONFIDENTIAL level.

8.1 OPSEC Protection

The Contractor is required to provide Operations Security (OPSEC) protection for all classified information (as defined by FAR 4.401) and sensitive information (as defined by Section 3(d)(4) of PL 100-235 (101 Stat 1727)), pursuant to the National Security Decision Directive 298 of 22 January 1988 and DFARS Clause 252.239-7016. In order to meet this requirement, the Contractor shall develop, implement and maintain a facility level OPSEC program to protect classified and sensitive information to be used at a Contractor's and Subcontractor's facilities during the performance of this contract. The Contractor is responsible for Subcontractor implementation of the OPSEC program requirements for this contract.

8.2 Foreign Travel

If foreign travel is required and since foreign travel requirements vary from Country, all outgoing Country/Theater clearance message requests shall be submitted to the SPAWAR Systems Center Pacific (SSC PAC) foreign travel team, OTC2, Rm 1656 for action. A Request for Foreign Travel form shall be submitted for each traveler, in advance of the travel to initiate the release of a clearance message at least thirty-five (35) calendar days in advance of departure. Each Traveler must also submit a Personal Protection Plan and have a Level 1 Antiterrorism/Force Protection briefing within one year of departure and a country specific briefing within ninety (90) calendar days of departure.

9.0 POINTS OF CONTACT

Contracting Officer's Representative (COR): Rashid Neighbors, email: rashid.neighbors@navy.mil, phone: 619-524-7616

Technical Point of Contact (TPOC): Jason Ferrigno, email: jason.ferrigno@navy.mil, phone: 858-537-8644

10.0 ADDITIONAL REQUIREMENTS

10.1 Prohibited Packing Materials

The use of asbestos, excelsior, newspaper or shredded paper (all types including waxed paper, computer paper and similar hydroscopic or non-neutral material) is prohibited. In addition, loose fill polystyrene and plastics as packing materials are prohibited for items destined for afloat units.

10.2 Marking of Shipment

Each shipment of material and/or data shall be clearly marked to show the following information:

SHIP TO:	MARK FOR:
RECEIVING OFFICER	Contract #:_____
	Item #:_____
	Receiving Officer Code: _____

The receiving office address will be specified by the Government via Technical Direction Letter (TDL).

10.3 Unpacking Instructions: Complex or Delicate Equipment

(a) Location on Container

When practical, one set of the unpacking instructions will be placed in a heavy water-proof envelope prominently marked "UNPACKING INFORMATION" and firmly affixed to the outside of the shipping container in a protected location, preferably between the cleats on the end of the container adjacent to the identification marking. If the instructions cover a set of equipment packed in multiple containers, the instructions will be affixed to the number one container of the set. When the unpacking instructions are too voluminous to be affixed to the exterior of the container, they will be placed inside and directions for locating them will be provided in the envelope marked "UNPACKING INFORMATION."

(b) Marking Containers

When unpacking instructions are provided shipping containers will be stenciled "CAUTION--THIS EQUIPMENT MAY BE SERIOUSLY DAMAGED UNLESS UNPACKING INSTRUCTIONS ARE CAREFULLY FOLLOWED. UNPACKING INSTRUCTIONS ARE LOCATED (Contractor shall state where instructions are located)." When practical, this marking will be applied adjacent to the identification marking on the side of the container.

(c) Marking

All shipping containers will be marked in accordance with MIL-STD-129 "Military Standard Marking for Shipment and Storage."

10.4 Marking of Warranted Items

(a) Each item covered by a warranty shall be stamped or marked in accordance with MIL-STD 129 "Marking for Shipment and Storage." Where this is impracticable, written notice shall be attached to or furnished with the warranted item.

(b) Warranted items shall be marked with the following information:

(1) National stock number or manufacturer's part number
(2) Serial number or other item identifier (if the warranty applies to uniquely identified items
(3) Contract number
(4) Indication that a warranty applies
(5) Manufacturer or entity (if other than the Contractor) providing the warranty
(6) Date or time when the warranty expires
(7) Indication of whether or not attempted on-site repair by Government personnel will void the warranty

APPENDIX A: SYSTEM TECHNICAL MANUAL

1.0 GENERAL REQUIREMENTS

The System Technical Manual (STM) shall describe the overall operation and maintenance of the system; it shall include all safety requirements, labels, hazards, warnings and precautions pertaining to the system.

2.0 OVERALL SYSTEM FUNCTIONAL DESCRIPTION

a) The overall system functional description shall be of enough detail for an operator or technician to be able to trace the various modes of operation through the various signal paths. An overall functional description of each major component within the system also shall be provided. The description provided shall include, at a minimum, a one line diagram showing: signal flow through the major system equipment, including signal amplification and attenuation points; frequency conversions (radio frequency (RF) to intermediate frequency (IF), etc.); feedback loops; and multiplexing (mux), de-multiplexing (demux), modulation (mod) and de-modulation (demod) points.

b) The overall system functional description also shall contain information describing the interfacing with other systems provided by the ship. The description of the ship components interfacing shall include, but not be limited to, a one line diagram showing: ventilation requirements, including normal and emergency air flow; minimum and maximum temperatures; system cooling (air or water) including source of cooling, normal and emergency air and water flow, and minimum and maximum temperatures; interface power requirements including the power panels, breakers, and emergency shut down capabilities of the system; and ship's gyro and other navigation inputs.

3.0 OPERATION

a) The STM shall contain the procedures to turn the system on; to perform test (via built-in test equipment or other system tests) to assure the operator the system is operating properly; and the proper sequence to shut down the system without causing harm to personnel or equipment.

b) The STM shall describe the various operational capabilities and how to configure the equipment to achieve each of those capabilities.

c) The operational description shall not duplicate the individual equipment technical manuals, but shall provide enough information so an operator can, under normal conditions, turn on, acquire, synchronize and distribute the signals as required.

d) If any modes of operation require step by step procedures to configure the system, the procedures shall be developed for the whole system, referencing the applicable equipment manual paragraphs, but keeping any duplication of equipment operating procedures to a minimum.

e) If any modes of operation only require general statements to configure the system (e.g., turn on the receiving equipment and set the receiver to the prescribed frequency), individual equipment technical manual operating procedures shall be referenced and duplication keep to a minimum.

f) If any modes of operation require a detailed operating procedure of one or two equipment within the system, the STM shall refer to that equipment's technical manual for the detailed operating procedures.

g) The STM shall describe the necessary procedures for emergency operation of the system, and describe the limitation in capabilities of the various failed conditions where the system can still operate at full or reduced capabilities. The STM shall describe what failures would put the system out of commission (e.g., total loss of antenna capabilities, power supply, etc.) and provide a reference the applicable equipment specific technical manuals paragraphs, fault indications and codes, and associated troubleshooting procedures, flow charts and fault logics diagrams.

4.0 MAINTENANCE

a) The STM shall contain all the information necessary to install the system, including site preparation, space requirements, cooling requirements, temperature limits, power requirements, manufacturing and building of mountings for antenna and equipment racks, and wire runs including cable designator and function. The STM shall include unpacking/packing and inspection of all equipment, unless the individual equipment technical manual contains that information for the equipment. The STM shall describe the procedures for running cables through areas with watertight integrity, and the parts and procedures necessary to return the space to watertight specifications. The STM shall not contain

detailed information for installation of individual equipment unless it is not in the individual equipment technical manuals.

b) The STM shall include, but not be limited to, a detailed wiring diagram showing the input and output of all major units within the system. The diagram shall include all system interfacing cable designations, and all cable connections and their plug and/or jack pin outs. Cables identified shall show ship systems interfacing to the system (e.g., gyro and other navigation interfacing, and ship power interface), signal flow and power provided.

c) The STM shall contain diagrams for all mechanical interfacing required for the system (e.g., ventilation, cooling for water and/or air, isolation of mechanical interfacing as required for system maintenance, and alternate methods of maintaining system operation during the loss of a normal environment). The STM shall provide procedures for the repair or replacement of fans, filters and other items external to the equipment within the system.

d) The STM shall provide trouble-shooting procedures and system level fault logic diagrams to isolate a problem to a unit, sub-assembly or LRU. The STM shall reference, but not provide trouble shooting or removal and replacement procedures for the individual equipment and LRUs unless they do not exist in the individual equipment manuals. Trouble shooting to the system level can be achieved by, but not be limited to: built-it-test equipment (BITE); signal tracing using standard Navy test equipment; signal injection; and isolation.

5.0 LOGISTIC SUPPORT

a) The STM shall list all special and general test equipment and tools necessary to trouble shoot and repair to the system level. Special tools and test equipment required for individual equipment trouble shooting and repair shall not be included unless they are not documented in the applicable equipment level manual(s). If any hazardous material is required, the appropriate hazardous material group of section 3.6.2.3 of the specification shall be referenced.

b) The STM shall provide a top down description of all system components and LRUs. Reference designators and noun names of individual equipment shall be used in describing the system.

c) The STM shall limit the parts identified in the manual to the system level. No duplication of individual equipment parts lists are to be entered in this manual unless the part is common to the system and equipment. The parts list shall include: noun name of the part; Navy reference designator; Navy part number, if assigned; commercial part number; quantity and locations where required; national stock number, if assigned; and manufacturer CAGE Code. The information shall not be designed to replace the ship's allowance part list APL, but rather to be a quick reference used in conjunction with the ship's APL and Coordinated Shipboard Allowance Lists (COSAL).

d) The STM shall contain a list of the system's wiring interfaces that include each cable function; commercial wire type; Navy wire designation; and special handling and environmental requirements.

6.0 SCHEMATICS, DRAWINGS AND TABLES

a) The STM shall provide system level wiring diagrams in enough detail to identify each cable, each wire in the cable; the signal and/or power provided by that wire; identification of wire and cable connector terminations, plugs, jacks and/ or pins; and any wires not used within the cable.

b) The STM shall include system diagrams in enough detail to identify system level test points, and shall identify expected signal and/or voltage levels at each test point. Actual pictures of an oscilloscope during system testing are desired in this diagram. The test points and normal signal levels shall accurately reflect the procedures for system trouble shooting.

c) The STM shall include, but not be limited to, tables that list such items as equipment technical manuals and other reference documents.

APPENDIX B: USAGE INSTRUCTIONS – SPAWAR USM TECHNICAL MANUAL CONTRACT REQUIREMENTS TEMPLATE FOR TECHNICAL MANUALS IN PDF FORMAT

Reference:

(a) SPAWAR, PEO C4I, PEO Space and PEO EIS Policy, Procedures And Responsibilities For Technical Manual Management Operations And Product/Technical Data Lifecycle Support (SPAWARINST 4160.3B)

The contractor shall prepare a Commercial Broadband Satellite Program (CBSP) Unit Level Variant (ULV) Interactive Electronic Technical Manual (IETM) in digital format as prescribed by the ASN RDA Memorandum of October 23, 2004 titled *DON Policy on Digital Product/Technical Data* and in accordance with SPAWARINST4160.3B. The resulting technical manual documenting the CBSP ULV system functionality, operation and maintenance shall be in XML source format, provided to the Government in accordance with the Technical Manual Contract Requirement TMCR Number 120005.

TECHNICAL MANUAL CONTRACT REQUIREMENTS (TMCR)
CONTRACT #: N00039-13-R-0005
Commercial Broadband Satellite Program (CBSP) Unit Level Variant (ULV)
TMCR# 120005

1. SCOPE

This TMCR defines the contractual requirements for technical manual development in support of CBSP ULV conforming to the Unified Systems Manual (USM) initiative and delivering technical manuals in Portable Document Format (PDF). This task order is within the scope of Contract, N00039-13-R-0005.

2. BACKGROUND

Operator requirements for accessing Command, Control, Communications, Computers & Intelligence (C4I) information via context-sensitive, web-enabled interfaces are driving the evolution of technical data technology. The concept of a document as a single entity structured by volume, chapter, and paragraph has given way to the idea that technical documentation can be modeled, represented, manipulated, and reused in a fashion similar to structured data via eXtensible Markup Language (XML).
USM is the next generation of technical documentation developed by PEO C4I and SPAWAR. It provides technical documentation writers and managers with an XML-based document model for writing system operations as a unified set of XML documents describing the system as a set of interacting components. USM may also be used to develop maintenance and repair manuals. USM content is structured according in a Job-Task format to orient content toward user task-performance and provide easier integration with training materials and quick reference guides. The Technical Document Acquisition and Development (TDAD) website provides access to the Content Management Capability (CMC), a content management system used to standardize development and promote enterprise visibility and content reuse across PEO C4I.

3. OBJECTIVES

The United States Department of Defense (DoD) desires a common standard for developing and sustaining interoperable technical data for use across training and technical manuals, and by joint operations. This standardized data will also improve publication quality and consistency, reduce development time, and simplify the warfighter's access to information.
The contractor should use the USM DTDs to support this goal by:

- Adopting the standard S1000D development methodology and process
- Establishing and supporting uniform authoritative data sources (via reusable XML data modules)
- Reusing authoritative data sources where possible
- Posting their XML data modules to a common source database accessible across the enterprise.

4. APPLICABLE DOCUMENTS

4.1 General

The documents listed in this section are applicable to this TMCR. This section does not include documents cited in other sections of this TMCR or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned they must meet all specified requirements documents as cited in this TMCR, whether or not they are listed.
The following specifications, policies, instructions, standards, and handbooks form a part of this document to the extent specified herein.

4.2 Specifications

- MIL-PRF-28001C Markup Requirements and Generic Style Specification for Exchange of Text and its Presentation
- MIL-PRF-28002C Raster Graphics Representation in Binary Format, Requirements for

4.3 Policy and Instructions

The following policies are available for download through the SPAWAR Technical Document Acquisition and Development (TDAD) website at https://tdad.nmci.navy.mil:

- SPAWARINST 4160.3B – SPAWAR, PEO C4I, PEO Space, and PEO EIS Policy, Procedures And Responsibilities For Technical Manual Management Operations And Lifecycle Support – provides SPAWAR policy and instructions on the use of USM for technical documentation.
- DON Policy on Digital Product / Technical Data (dated 23 October 2004) – provides ASN-RDA guidance on digital data acquisition including specific guidance on XML.
- E0005-AC-HBK-010/TMMP, Revision 2, NAVSEA/SPAWAR Technical Manual Management Program, Operations and Life Cycle Support Procedures – provides procedures for managing paper and page-oriented digital technical manuals.
- NAVSEA Memo 23 July 1999 – ETM/IETM CD-ROM Management and Testing

4.3.1.1 STANDARDS

- XML 1.1 – Worldwide Web Consortium (W3C) specification for authoring well formed and valid XML (http://www.w3.org/TR/xml11/).
- COMNAVAIRFORINST 4790.2A - Acronyms, Abbreviations and Definitions.
- System Level Data Document (SLDD) Document Type Definition (DTD) Version 4 Rev 2 – the XML DTD for validating USM descriptions of system level documents.
- Component Product Data Document DTD Version 3 Rev 2 - the XML DTD for validating USM description of component level documents.

4.3.1.2 HANDBOOKS

The following documents are available on the TDAD website (https://tdad.nmci.navy.mil):

- USM Content Writers Guide – provides generic guidance on writing task based content and a detailed description of the USM CPDD and SLDD DTDs.
  USM Content Management and Configuration Control Guide – provides guidance on managing the USM-DMI process.
- MIL-HDBK-9660B – provides guidance on DoD-produced CD-ROM products.

4.3.2 Other Government Publications

The following documents are available on the TDAD website (https://tdad.nmci.navy.mil):

- TDAD Concept of Operation – provides high level concept description of the TDAD website and related tools
- ATIS Compatibility Testing Procedures – provides instructions for confirming that a technical manual is ATIS compatible
- TM QA Records:
  - NAVSEA/SPAWAR Technical Manual Deficiency Evaluation Form (NAVSEA 4160/1)
  - Technical Manual Validation Certificate (NAVSEA/SPAWAR Data Item Description (DID) DI-TMSS-81819)
  - Verification Discrepancy/Disposition Record (NAVSEA/SPAWAR DID DI-TMSS-81820)
  - Technical Manual Verification Incorporation Certificate (NAVSEA/SPAWAR DID DI-TMSS-81821)
  - NAVSEA Technical Manual Certification Sheet (NAVSEA/SPAWAR Form 4160/8)
  - Technical Manual In-Process Review (IPR) Discrepancy Disposition Record (NAVSEA/SPAWAR Form 4160/10)
- Baseline Word Lists for NAVSEA/SPAWAR Technical Manuals (EL/SL160-AA-LST-010)

4.3.3 Non-Government Publications

None.

5. TECHNICAL MANUAL DEVELOPMENT REQUIREMENTS

The Contractor shall develop system level technical documentation in XML format using the specified SLDD and CPDD DTDs. Once developed, XML technical manuals will be imported into the TDAD Content Management Capability (CMC), where they will be checked to determine if they are well formed, and where they can be converted from XML to a linked PDF presentation. The linked PDF can be exported from the TDAD CMC for delivery to end users via ATIS-compatible CD-ROMs. Note that HTML is not an acceptable presentation format.

5.1 Work to be performed:

5.1.1 Preparations and Setup

The contractor shall, in preparations for authoring content in USM, perform the following:

- Ensure that technical writers have the necessary skills to author XML content using the USM DTDs.
- Read the government furnished information on USM specified in this document.
- Identify the specific individuals for a program and system who will upload completed XML documents to the CMC and Technical Manual Library accessed from TDAD. Ensure they have TDAD accounts. Work with TDAD administrators to ensure those TDAD accounts are assigned to the correct groups for appropriate permissions.
- Ensure that all personnel who will be using the USM CMC understand how to upload an XML file and convert it to PDF.
- Ensure that all personnel who will be using the Technical Manual Library understand how to upload a file and use the Technical Manual Library.
- Ensure that all personnel have DoD-authorized PKI certificates (required for TDAD access).

5.1.2 Prototype Content Development

The contractor shall conduct a period of USM prototype content development and TDAD familiarization. During this period, content developers shall ensure they become proficient in the use of XML to author both SLDD and CPDD XML content, create links between CPDD and SLDD content, and use the USM CMC to import XML content, convert XML to PDF for review, and publish completed linked PDF technical manuals (from a SLDD and associated CPDDs) for delivery on CD-ROM..

5.1.3 System Component and Job Task Analysis

The contractor shall conduct a system analysis to produce a Job Task Analysis (JTA) and a system component functional breakdown spreadsheet. The JTA spreadsheet shall organize system functionality according to Jobs, then Duties then Tasks/Subtasks or Topics/Subtopics. This spreadsheet shall serve as the basis for creation of the SLDD structure. The system component functional breakdown spreadsheet shall organize the system's physical (hardware) or logical (software) components into a nested Work Breakdown Structure (WBS) to facility mapping system components to specific CPDD documents and organizing components into one or more systems represented by SLDD documents. Each component shall be assigned a WBS number.

5.1.4 Content Development Deliverables

The contractor shall conduct the following work to develop and deliver content to the government.

5.1.4.1 Content Development Schedule

A content development schedule shall be created and maintained using milestones provided by the TM Acquisition Plan as government-furnished information (GFI). The schedule shall provide a development, validation, verification, and delivery timeline for all SLDD, CPDD and media content developed as part of the effort. The schedule shall also provide a timeline for period status reports and Interim Progress Reviews (IPRs).

5.1.4.2 Project Status Reports

A project status report shall be created and delivered according to the period prescribed on the task order, typically monthly. The report shall indicate development progress against the schedule.

5.1.4.3 Interim Progress Reviews

Contractor shall hold quarterly IPRs and submit IPR brief with minutes and an action item list to the government upon completion as it pertains to the technical manual development per CDRL A003, Contractor's Progress, Status, and Management Report.

5.1.4.4 SLDD and CPDD XML Source Files

The contractor shall develop SLDD documents in accordance with the JTA. The contractor shall register with the Technical Data Information Management System (TDMIS) and obtain a Technical Manual Information Number System (TMINS) number for each SLDD. SLDD documents shall be named using the following scheme:

TMINS#_SystemName_sldd.xml

If the technical manual includes component documentation, the contractor shall also develop CPDD documents in accordance with the system functional breakdown. CPDDs shall be named using to the following scheme:

WBS_(Sub)SystemName_ComponentName_cpdd.xml

XML source files (SLDDs and CPDDs) shall be considered delivered to the government when they are uploaded to the CMC repository. No separate delivery is required.

5.1.4.5 Media Source Files

Binary media files shall be developed in a vector format, preferably Scalable Vector Graphics (SVG) or Computer Graphics Metafile (CGM), and shall be considered delivered to the government when they are uploaded to the TDAD CMC repository. No separate delivery is required.

5.1.4.6 Evidence of Content Review and Validation

The contractor shall conduct content Subject Matter Expert (SME) reviews, then internal validation. Validation shall be documented by the government using the following form:

5.1.4.6.1 Technical Manual Validation Certificate (NAVSEA/SPAWAR DID DI-TMSS-81819)

This record shall be maintained in the TDAD Technical Manual Library.

Once validation has been successfully completed, the contractor shall ensure that the manual's publication status in TDMIS and the TDAD Technical Manual Library are updated to reflect "Preliminary Issue" status.

5.1.4.6.2 PDF Assembly of a Single Technical Manual

Once validated, the contractor shall use the USM CMC to convert SLDDs, with their associated CPDDs, into system level technical manuals in linked PDF format. Using Adobe Acrobat, the contractor shall assemble the SLDD PDF, and all associated CPDD PDFs created by the USM CMC, into a single technical manual named according to the following scheme:

TMINS#.pdf

The PDF technical manual may include bookmarks produced by the USM CMC. The contractor may also create more detailed bookmarks in the PDF.

The contractor shall submit these linked PDF technical manuals to the government or a designated verification activity to verify technical documentation.

Note that all output formatting is automatically handled by the USM CMC conversion tool and stylesheets when it is converted from the source XML to PDF; therefore this TMCR contains no presentation formatting guidelines.

5.1.4.7 Content Verification and Certification

Verification shall consist of content checks against operations as part of system testing, and a check of technical content against contractual requirements. The government shall be responsible for verification; however the contractor shall provide support during this process. Any problems in the content shall result in correction and validation prior to republishing as PDF and re-verification. Verification shall be documented by the government using the following forms:

- Verification Discrepancy/Disposition Record (NAVSEA/SPAWAR DID DI-TMSS-81820)
- Technical Manual Verification Incorporation Certificate (NAVSEA/SPAWAR DID DI-TMSS-81821)

These records shall be maintained in the TDAD Technical Manual Library.
Once the verified manual and all corresponding validation / verification forms have been uploaded to TDAD, then the contractor shall ensure that the manual's publication status in TDMIS and TDAD are updated to reflect "Final Issue" status.

5.1.4.8 TMPOD Manual

The contractor shall use Adobe Acrobat if necessary to create a PDF presentation of a single SLDD and associated CPDDs as a single combined PDF file that is TMPOD-compliant for "text only " and "fold out" versions of the technical manuals. The text-only and foldout-only versions shall be named according to the following scheme:

- Text Only – TMINS#TXT.pdf
- Foldouts Only – TMINS#FO.pdf

The TMPOD versions of the manual shall be delivered via upload to TDAD. Once loaded into TDAD, the contractor shall send a notice of delivery to the government along with a delivery letter for verification and acceptance according to procedures provided by SPAWAR Headquarters Code 4.3.3.

5.1.4.9 ATIS-Compatible CD-ROM

Verified technical manuals, and any referenced non-USM technical manuals (in PDF format), shall be loaded onto a CD-ROM along with appropriate indexes and tested for ATIS compatibility. The CD-ROMs shall be properly marked and delivered to users as part of the system installation Integrated Logistics Support (ILS) package. The contractor shall deliver two copies of properly classified and marked CD-ROMs to the government. The CD-ROM source file shall be uploaded to TDAD in International Organization for Standardization (ISO) format for future reproduction.
Naval Systems Data Support Activity (NSDSA) and Port Hueneme shall pull technical manual PDFs from TDAD for loading TMPODS and ensuring that the manual is available for requisition via the Naval Logistics Library (NLL).

5.2 Technical Manual Points of Contact

- Acquisition Program Manager – Logistics: Gary Ford
- Technical Manual Manager: To Be Determined
- Technical Manual Manager Support Logistician: To Be Determined

6. MISCELLANEOUS

6.1 Period of Performance

The period of performance for this task is:

6.2 Place of Performance

The majority of work will be performed at the following address:

- Contractor facilities: To be determined

6.2.1 Access to TDAD

The government shall provide access to TDAD for management of deliverables required by this TMCR. The contractor shall designate one or more Contractor TM Development Leads, in writing, and ensure these personnel obtain TDAD accounts.
The government shall configure the TDAD applications to provide appropriate access to all personnel required to manage technical manual documentation and source XML data.

6.2.2 USM Documentation

The government shall provide all USM documentation referenced by this TMCR to include handbooks, DTDs, the CONOPS and introduction documents, CMC manuals and JTA/component functional breakdown analysis spreadsheet template.

6.3 Distribution

All system level technical manuals and CD-ROMs shall be properly classified and marked prior to distribution in accordance with NAVSEA/SPAWAR TMMP Operations and Life Cycle Support Procedures [S0005-AA-PRO-010/TMMP Revision 02 (Preliminary) and E0005-AC-HBK-010/TMMP Revision 00 and MIL-HDBK-9660B - DOD PRODUCED CD-ROM PRODUCTS.

6.4 Special Packaging and Shipping Instructions/Markings

The contractor will use standard commercial packaging and marking practices in the delivery of this order.

APPENDIX C: FAILURE MODES AND EFFECTS ANALYSIS

In accordance with paragraph . 10.2of the Commercial Broadband Satellite Program (CBSP) Unit Level Variant (ULV) Statement of Work (SOW), the Contractor shall perform a Failure Modes and Effects Analysis (FMEA) for the CBSP ULV design. The FMEA shall be performed by the Contractor using the following information as a minimum:

1. Identification Number - A serial number or other reference designation identification number is assigned for traceability purposes on the worksheet. A uniform identification code shall be used to provide consistent identification of system/equipment/MSI functions and provide complete visibility of each failure mode and its relationship to the system/equipment/MSI functions identified in the applicable block diagrams.
2. Item / Functional Identification - The name or nomenclature of the item or system function being analyzed for failure mode and effects is listed. Schematic diagram symbols or drawing numbers shall be used to properly identify the item or function.
3. Function - A concise statement of the function performed by the hardware item shall be listed. This shall include both the inherent function of the part and its relationship to interfacing items.
4. Failure Modes and Causes - All predictable failure modes for each indenture level analyzed shall be identified and described. Potential failure modes shall be determined by examination of the item outputs and functional outputs in applicable block diagrams and schematics. Failure modes of the individual item function shall be postulated on the basis of the stated requirements in the system definition narrative and the failure definitions included in the ground rules. The most probable causes associated with the postulated failure mode shall be identified and described. Since a failure mode may have more than one cause, all probable independent causes for each failure mode shall be identified and described.
5. Mission Phase / Operational Mode - A concise statement of the mission phase and operational mode in which the failure occurs. Where sub- phase, event, or time can be defined from the system definition and mission profiles, the most definitive timing information should also be entered for the assumed time of failure occurrence.
6. Failure Effect - The consequences of each assumed failure mode on item operation, function, or status shall be identified, evaluated, and recorded. Failure effects shall focus on the specific block diagram element which is affected by the failure under consideration. The failure under consideration may impact several indenture levels in addition to the indenture level under analysis; therefore, “local,” “next higher level,” and “end” effects shall be evaluated. Failure effects shall also consider the mission objectives, maintenance requirements, and personnel and system safety. The indenture level detail shall be as follows:

a. Local Effects - Local effects concentrate specifically on the impact an assumed failure mode has on the operation and function of the item in the indenture level under consideration. The consequences of each postulated failure affecting the item shall be described along with any second-order effects which result. The purpose of defining local effects is to provide a basis for evaluating compensating provisions and for recommending corrective action. It is possible for the local effect to be the failure mode itself.

b. Next Higher Level - Next higher level effects concentrate on the impact an assumed failure has on the operation and function of the items in the next higher indenture level above the indenture level under consideration. The consequences of each postulated failure affecting the next higher indenture level shall be described.

c. End Effects - End effects evaluate and define the total effect an assumed failure has on the operation, function, or status of the uppermost system and any safety and IA considerations and operational impacts.

7. Fault Detection - A description of the methods by which occurrence of the failure mode is detected by the operator shall be recorded. The failure detection means shall show a breakdown of BIT/BITE coverage by type and shall address the following:
    a) Visual - Display (e.g., fault message, status screens, etc.), indicator (e.g., drawer front panel, etc.), other unique indications, or none shall be identified.
    b) Audio - Audible warning (i.e., major fault or minor fault), other unique indications, or none shall be identified.
    c) Hardware (HW) BIT - Detail the sensing component, module, or device that detected the fault and under what condition (e.g., thermal sensor detected over temp condition).
    d) Software (SW) BIT - Detail the BIT status word used to flag the fault, the reporting scheme within the overall BIT architecture, and the methodology used for the central BIT engine to report the fault.
    e) BIT Performance - Detail the reliability lambda that was covered by the fault detection BIT.
8. Fault Isolation - A description of the methods by which occurrence of the failure mode is isolated by the operator/maintainer shall be recorded. The failure isolation means shall address the following:

a) Action - Describe the most direct procedure that allows an operator/maintainer to isolate the malfunction or failure. An operator/maintainer will know only the initial symptom until further specific action is taken such as performing a more detailed BIT, test equipment reading, or other analysis. Note that fault isolation shall be done without the use of spare assets (i.e., no spares used for subassembly isolation).
b) Visual - Display (e.g., fault message, status screens, etc.), indicator (e.g., drawer front panel, etc.), other unique indications, or none shall be identified.
c) Audio - Audible warning (i.e., major fault or minor fault), other unique indications, or none shall be identified.
d) HW BIT - Detail the sensing component, module, or device that detected the fault and under what condition (e.g., thermal sensor detected over temp condition).
e) SW BIT - Detail the BIT status word used to flag the fault, the reporting scheme within the overall BIT architecture, and the methodology used for the central BIT engine to report the fault.
f) BIT Performance - Detail the reliability lambda that was covered by the fault detection BIT.

9. Severity Classification - A severity classification category shall be assigned to each failure mode and item according to the failure effect using the following categories:

a) Category I - Catastrophic - A failure which may cause death or weapon system loss.
b) Category II - Critical - A failure which may cause severe injury, major property damage, or major system damage which will result in mission loss.
c) Category III - Marginal - A failure which may cause minor injury, minor property damage, or minor system damage which will result in delay or loss of availability or mission degradation.
d) Category IV - Minor - A failure not serious enough to cause injury, property damage, or system damage, but which will result in unscheduled maintenance or repair.

The effect on the functional condition of the item under analysis caused by the loss or degradation of output shall be identified so the failure mode effect will be properly categorized. For lower levels of indenture where effects on higher levels are unknown, a failure's effect on the indenture level under analysis shall be described by the severity classification categories.

10. Basic Maintenance Actions - Describe the basic actions which must be taken by the maintenance technician to correct the failure. Identify the special design provisions for modular replacement and any adjustments and calibration requirements following repair.

11. Compensating Provisions - The compensating provisions, either design provisions or operator actions, which circumvent or mitigate the effect of the failure shall be identified and evaluated. This step is required to record the true behavior of the item in the presence of an internal malfunction or failure.

12. Design Provisions - Compensating provisions which are features of the design at any indenture level that will nullify the effects of a malfunction or failure, control, or deactivate system items to halt generation or propagation of failure effects, or activate backup or standby items or systems shall be described. Design compensating provisions include:

a) Redundant items that allow continued and safe operation,
b) Safety or relief devices such as monitoring or alarm, provisions which permit effective operation or limits damage, and
c) Alternative modes of operation such as backup or standby items or systems.

13. Operator Actions - Compensating provisions which require operator action to circumvent or mitigate the effect of the postulated failure shall be described. The compensating provision that best satisfies the indication(s) observed by an operator when the failure occurs shall be determined. This may require the investigation of an interface system to determine the most correct operator action(s). The consequences of any probable incorrect action(s) by the operator in response to an abnormal indication should be considered in the effects recorded.

14. Remarks - Any pertinent remarks pertaining to and clarifying any other column in the worksheet line shall be noted. Notes regarding recommendations for design improvements shall be recorded and further amplified in the FMEA report.

This Appendix C is to be considered, in whole or in part, a fully enforceable requirement for the satisfactory performance of the activities contained in the CBSP ULV SOW, and is incorporated therein by reference.

ACRONYMS

Acronym	Definition
ADE	Above Deck Equipment
APLS	Allowance Parts Lists
BDE	Below Deck Equipment
BIT	Built in Test
BITE	Built in Test Equipment
BOM	Bill of Materials
C&A	Certification and Accreditation
CBSP	Commercial Broadband Satellite Program
CD	Compact Disc
CDMD-OA	Configuration Data Manager's Database-Open Architecture
CDR	Critical Design Review
CDRL(s)	Contract Data Requirements List(s)
CFR	Code of Federal Regulations
CI(s)	Configuration Item(s)
COR	Contracting Officer's Representative
DIACAP	Department of Defense Information Assurance Certification and Accreditation Process
DISA	Defense Information System Agency
DMSMS	Diminishing Manufacturing Sources and Material Shortages
DoD	Department of Defense
DON	Department of Navy
DPD	Data Product Deliverables
DSCS	Defense Satellite Communication System
ECP	Engineering Change Proposal
EMI	Electromagnetic Interference
EMITP	Electromagnetic Interference Test Procedure
EMITR	Electromagnetic Interference Test Report
FRCB	Fleet Readiness Certification Board
GFE	Government Furnished Equipment
GFI	Government Furnished Information
IA	Information Assurance
ICAPS	Interactive Computer Aided Provisioning System
ICD	Installation Control Drawing
INCO	Installation and Checkout Spares
ISO	International Organization for Standards
IT	Information Technology
LRU	Lowest Replaceable Unit
MCO	Master Change Orders
MILSATCOM	Military Satellite Communications
MTBF	Mean Time Between Failures
NAVSUP WSS	Naval Supply Weapons System Support
NSN	National Stock Number
OBRP	On Board Repair Parts

ODC(s)	Other Direct Cost(s)
OEM	Original Equipment Manufacturer
OPSEC	Operational Security
OSHA	Occupational Safety and Health Agency
OTA	Over the Air
PCO	Procurement Contracting Officer
PDR	Preliminary Design Review
PIO	Provisioning Item Ordering
PLISN	Provisioning List Item Sequence Number
RFD	Request for Deviation
RFW	Request for Waiver
SATCOM	Satellite Communications
SDFP	Supplemental Data for Provisioning
SMR	Source, Maintenance, and Recoverability
SOW	Statement of Work
SPS	Statement of Prior Submission
STIG(s)	Security Technical Implementation Guides
TDL(s)	Technical Direction Letter(s)
TPOC	Technical Point of Contact
ULV	Unit Level Variant